Finn Hill Neighborhood Alliance
Kirkland, Washington
April 2, 2014

Proposal for

Assessment Services for Kirkland – Pilot Residential Stormwater Audit Program

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Summary

This document is a proposal developed in response to the following notice published in Kirkland, Washington:

Notice – Request for Qualifications
For
Assessment Services
For
The Pilot Residential Stormwater Audit Program
For
The City of Kirkland, Washington

March 18, 2014

Pacific Northwest residents typically treat surface water as a problem to be solved. They route runoff away from their property as quickly as possible: Out of sight, out of mind, problem solved. However, in their haste to remain dry, residents are giving away a valuable resource.

In summer, residents often use municipal water to irrigate lawns, flowers, and vegetable gardens. A typical usage pattern for residential irrigation requires thousands of gallons of water during summer months. Municipal water used for irrigation must be paid for while free rainfall is ushered downhill without regard to its potential value to the homeowner.

This project extends work already being done in some Kirkland neighborhoods. It will identify potential solutions tailored to the needs and desires of individual homeowners, provide benefits to resource conservation efforts, and develop patterns for work that can extend beyond our city limits to help reverse current declines in water quality across the Puget Sound basin.

What follows is a project plan that utilizes existing best practices to assess surface water dynamics at individual residences in Kirkland, Washington. Lou Berner will conduct on-site visits to provide surface water audits for Kirkland residents identified by the City. Information from the audits will be used to create individualized narratives for each site and to develop a rapid assessment model to rate and compare surface water conditions between audit sites, enable trend analysis, and provide decision support for implementation of solutions to be developed for each homeowner.

Lou Berner will be the lead investigator, project manager, and the project liaison to City resources. No work on this project will be subcontracted. The Finn Hill Neighborhood Alliance will underwrite insurance requirements for the project.

I. Introduction

Most communities in the Puget Sound area are subject to similar surface water dynamics. Due to increasing areas of impervious surface and decreasing forest cover, runoff from hard surfaces is the number one threat to water quality. Because the Puget Sound basin is massive (Figure 1), we must manage surface water at the scale of individual watersheds, sub-basins, and wherever possible, at the level of individual residential parcels.

To improve water quality, best practices for surface water management include the following steps:

- Prevent runoff through best practices for low impact development (LID).
- Monitoring and education to identify specific hot spots and fix them.
- Address combined sewer outfalls to storm water systems.
- Small-scale solutions and innovations like rain gardens and cisterns.
- Include storm water planning as part of development planning.
- Include citizens and neighborhood groups whenever possible to encourage transparency, accountability, and to track trends and results.
- Develop best practices, share information, and multiply individual actions.
- Utilize the Puget Sound Partnership as a partner organization.

Figure 1. Puget country, the westernmost piece of the Pacific Northwest, is a natural drainage basin, its waters running into the grand inland sea, Puget Sound.

In the Pacific Northwest, rainfall that drains from roofs is typically viewed as a problem to be solved. Kirkland averages more than 18 inches of rain during the October to January wet season, and one inch of rainfall on a one-thousand square foot surface generates 600 gallons of runoff; a one-thousand square foot roof sheds 10,800 gallons of water each winter.

During wet months, homeowners endeavor to keep surface water out of their basements, away from foundations, and routed downhill as quickly as possible to the edge of their property or into the storm drain: Out of sight, out of mind, problem solved. However, in their haste to remain dry, residents are giving away a valuable resource.

In summer, residents often use municipal water to irrigate lawns, flowers, and vegetable gardens. A typical usage pattern for residential irrigation requires thousands of gallons of water during summer months. Municipal water used for irrigation must be paid for while free rainfall is ushered downhill without regard to its potential value to the homeowner.

In addition to washing harmful chemicals downstream, today's runoff events are shorter in duration and more dramatic than they were in historic times. We must work to restore the natural pattern of our landscape to hold rainfall as it occurs and release it over time. Reversing the dynamics of flash runoff is an essential step toward restoring water quality in Puget Sound.

The purpose of this project is to encourage homeowners to manage stormwater flows by tailoring surface water control options for individual properties. Homeowners will be more likely to implement surface water controls if they have a variety of tools at their disposal so they can choose what works best for their property.

Specific objectives and measures of success for residences included in this project:

- Provide homeowners a report with data specific to their property:
    - Provide measurements of total lot size and percent hard surfaces
    - Calculate runoff from hard surfaces (gallons of water from rainfall)
    - Calculate gallons of water used for irrigation (the difference between summer use and winter use)
    - Measure hard surfaces that could be converted to permeable surfaces, like driveways, walkways, sidewalks, and patios
    - Provide results of a percolation test for soil permeability
    - Review use of yard, garden, and car care chemicals relative to water quality
    - Calculate potential utility credit for diversion of water from sewer

- Provide recommendations to capture surface water and release it over time
    - Ways that runoff can be reduced or captured and released over time
    - Guidance for sizing and location of rain gardens, cisterns, tree planting, and conservation landscaping. Use high, medium, and low priority rankings

- Provide recommendations for LID rebates, incentives, and property tax credits
- Provide next steps for locating the best goods and services for LID projects

II. Project Approach and Methods

Lou Berner will conduct on-site visits to provide surface water audits for Kirkland residents identified by the City. Audits will be used to create individualized narratives for each site, to create a stoplight scorecard, and to develop a rapid assessment model to rate and compare surface water conditions between audit sites, enable trend analysis, and provide decision support for implementation of solutions.

Lou Berner will be the lead investigator, project manager, and the project liaison to City resources. No work on this project will be subcontracted. The Finn Hill Neighborhood Alliance will underwrite insurance requirements for the project.

The following format will be used for each residential audit:

Kirkland Residential Surface Water Audit Form			
Date		Site map	
Name		Watershed	
Address		Sub-basin	
E-mail/phone		Photo	
Audit ID		Photo	
Tax parcel		Photo	
			Score
Lot size	Sq. ft.	Score 1-3	
Hard surface	Sq. ft.	Score 1-3	
Percent hard surface	%	Score 1-3	
Terrain rating	Risk of slides, washouts, impact uphill/downhill	Score 1-3	
Permeability test	gallons/hour	Score 1-3	
Drains to street		Score 1-3	
Downspout complexity		Score 1-3	
Water use	gallons/year	Score 1-3	
Irrigation use	(sum gal – win gal)	Score 1-3	
Potential conversion of hard surface	Sq. ft.	Score 1-3	
Potential conversion of hard surface	%	Score 1-3	
		Total score =	
Comments, plan:			

Parameter definitions for the audit form:

- Lot size: Size of the tax parcel (square feet)
- Hard surface: Impermeable surface within the lot size (square feet)
- Percent hard surface: Impermeable surface/lot size x 100 (%)

- Terrain rating: Relative risk of slides due to a combination of soil type, slope, and aspect. Terrain rating also considers runoff that arrives on site from uphill and the impact of runoff downhill from the site.
- Permeability test: Drainage rate calculated using a standard infiltration test. I suggest using the average infiltration rate of 3 trials from two rings.
- Drains to street: Downspouts or other hard conveyance draining directly to the street.
- Downspout complexity: Simple downspout configurations will be easier to modify than those that are more complex. Simple configurations are likely to have a higher percentage capture rate with fewer modifications compared to complex configurations.
- Water use: Total water used, as reported by the provider (gallons)
- Irrigation use: Calculated as summer use (gallons) minus winter use (gallons)
- Potential conversion of hard surfaces: Calculate the surface area of driveway, sidewalk, walkway, patio, and any other impermeable surfaces (square feet)
- Potential conversion of hard surfaces, percent: Potential conversion of hard surfaces/Hard surface x 100 (%)
- Comments, plan: Narrative about potential solutions, sketch of mitigation design and site plan

Surface water mitigation tools: The following tools will be utilized to capture surface water and release it over time.

Downspouts

- Small – disconnect and allow to drain away from structures and allow runoff to percolate into the ground.
- Medium – disconnect and direct away from structures, allow runoff to percolate into the ground.
- Large – disconnect and re-connect into a conveyance that directs runoff into another mitigation feature, like a French drain.

Rain barrels

- Small – one or more static rain barrels, manually controlled valve.
- Medium – one or more rain barrels controlled by a mechanical float valve that releases runoff over 12-hours or more, may be routed to garden space via hose or drip irrigation.
- Large – multiple rain barrels controlled by an automated float valve controlled by software. This solution will delay release of runoff by longer time periods, so it will have the most positive effect.

Cisterns

- Small – Multiplies the work of rain barrels. This is an above-ground catchment of 100 gallons or more.
- Medium – Larger than multiple rain barrels, this solution might be a pre-fab concrete catchment of 500 gallons or more, buried. Can be tapped to run irrigation on a schedule, or connected to a cloud application that monitors weather to optimize water release. All new construction should include this device, at a minimum. Develop additional incentives for retrofit applications.
- Large – Can be located on an individual property or located for use by multiple residences. Pre-fab or custom built, these catchments hold many thousands of gallons of water, are underground, and are tapped to provide non-potable water year-round for

irrigation and aquifer recharge. Most will be controlled by a cloud application that monitors weather to optimize water release. Develop designs and software for medium and large solutions using grant funds.

French drains

- Small – Direct water away from structures where it can percolate into the ground.
- Medium – Direct water away from structures where it enters a rain garden.
- Large – Multiple veins direct runoff away from structures where it enters one or more rain gardens.

Conversion of hard surfaces

- Small – Replace a small walkway, porch, or patio with a permeable surface.
- Medium – Replace multiple hard surfaces. May require French drains.
- Large – Replace a driveway or significant percentage of hard surfaces. May require French drains.

Rain gardens

- Small – Route runoff from one or two downspouts to a small rain garden.
- Medium – Route a significant percentage of runoff to one or more rain gardens.
- Large – Install a personal micro-wetland to process large volumes of water and generate significant aquifer recharge.

Soil amendments

- Small – Regularly spread grass clippings and compost in garden beds.
- Medium – Till existing soil, add compost and organic material to garden beds.
- Large – Till existing soil, bring in yards of compost and organic material to mix with soil.

Tree planting

- Small – Plant one or more trees or native shrubs to provide shade and absorb rainfall.
- Medium – Develop new planting areas with multiple trees and native shrubs.
- Large – Develop new planting areas converted from hard surfaces. Plant multiple trees and native shrubs, and irrigate with runoff from hard surfaces.

Information required from Kirkland:

The following information about each residence will be ideal for getting the project started.

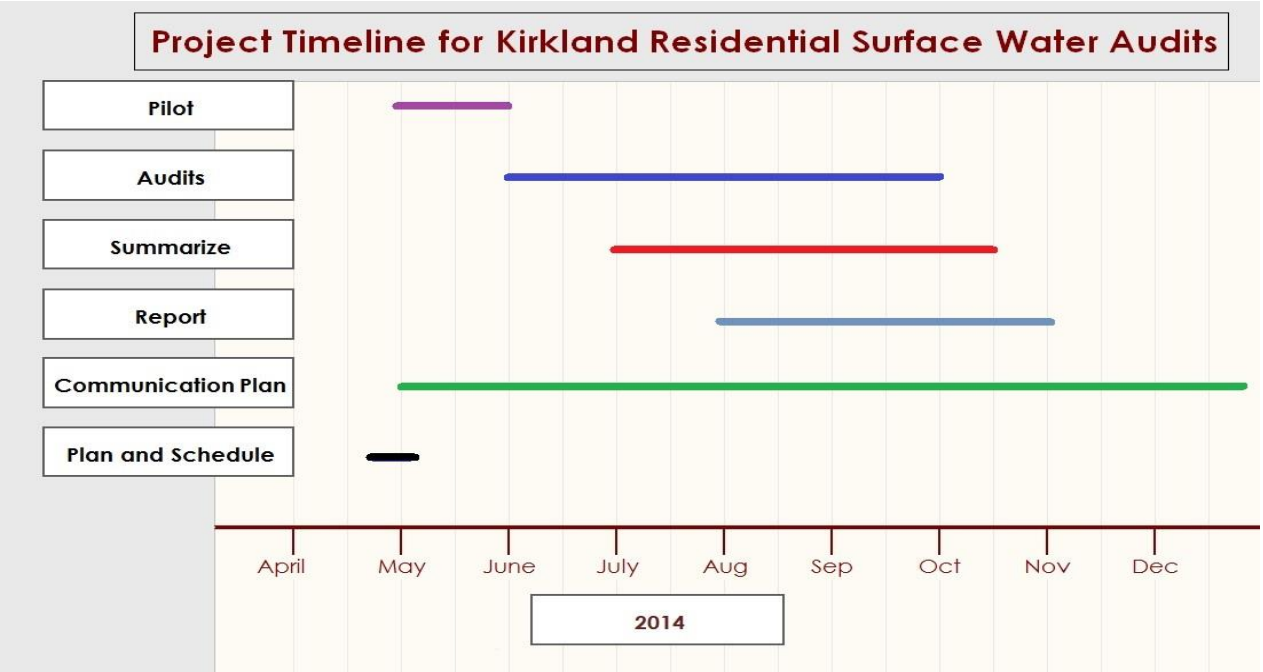
- Resident name, address, phone number, and e-mail address
- Tax parcel number
- Lot size (square feet)
- Hard surface (square feet)

Project data:

The following data will be used as baseline information for Kirkland, Washington.

- Jun-Sep average precipitation: 5.3 inches
- Oct-Jan average precipitation: 18.2 inches
- Average annual precipitation: 36.0 inches

The proposed project schedule is as follows:



III. Related Experience

I have extensive experience in study design, data analysis, interviewing a variety of audiences, and in environmental education. I have experience working with a variety of public agencies and agency personnel. I truly enjoy field work, interacting with the public, and providing community service. My CV is included with this proposal as Appendix A.

For the past several years I have worked on surface water monitoring and management in Kirkland's Finn Hill, Goat Hill, and Juanita neighborhoods. Examples of my work are included with this proposal as Appendix B, included as a separate attachment: J40 Habitat Assessment V1.0.pdf. Appendix C is a link to a document hosted online at finnhillalliance.org.

IV. Budget

The proposed budget is as follows. Invoices will be submitted every two weeks. A budget summary will be provided once a month.

	Description of Work	Anticipated Costs
	Planning, scheduling, research	$1,000
	Negotiate metrics and timelines	$1,000
	Audits, assessments, and recommendations	$7,000
	Reporting and communication	$1,000
	Total budget	**$10,000**

V. Endorsements

The following Kirkland residents can provide details regarding my skills and abilities to plan, manage, and complete a project like this.

Scott Morris
Trilogy International Partners LLC
155 108th Avenue, Suite 400
Bellevue, WA 98004
Desk: 425-458-5955
Cell: 206-972-9493
Email: scott.morris@trilogy-international.com

Kathy Schuler
FHNA Board of Directors
Communications Director
12401 89th Pl NE
Kirkland, WA 98034
Phone: 425-985-0004
Email: kathleenschuler@live.com

VI. Literature Cited

12,000 Rain Gardens in Puget Sound. http://www.12000raingardens.org/

Depave. http://depave.org/learn/resources/

Infiltration test method.
http://www.phillywatersheds.org/whats_in_it_for_you/residents/infiltration-test

Puget Sound Partners. 2012. LID Technical Design Manual for Puget Sound.
http://www.psp.wa.gov/LID_manual.php

VII. Appendix

The following documents support this project proposal. Appendix A is included below. Appendix B is a separate attachment. Appendix C is a link to a document hosted online at finnhillalliance.org.

Appendix A – CV for Louis Berner

Appendix B – J40 report

Appendix C – 2012 Finn Hill Surface Water Management Plan

Appendix A – CV for Louis Berner

Louis Berner
7911 Northeast 130th Street
Kirkland, Washington 98034

Employment History

Technical Writer, Project Manager **2001 – Present**

SQL Server User Education - Microsoft Corporation, Redmond, Washington

Coordinate documentation of software best practices and core functionality for Microsoft SQL Server management tools. Analyze customer data, support call details, and software data collection sets. Perform top task analysis to understand key end user scenarios and to identify customer pain points. Conduct research regarding product usability, user interface design, and content discoverability to improve the customer experience, reduce customer frustration, and reduce support costs.

Develop collaborative relationships with feature-level stakeholders including the customer community, program management, customer support, development, test, security, localization, marketing, legal, and release management to develop new approaches that build community, raise awareness, and deliver the right information at the right time. Represent the customer viewpoint in engineering efforts to design and improve software tools – Upgrade Advisors, Migration Assistants, System Configuration Checkers, the SQL Server Developer Dashboard, SQL Server management tools, and various customer-facing software wizards.

Push lessons learned and best practices information back into development processes, software functionality, and product documentation. Developed an award-winning engineering method to present integrated assistance solutions inside the software user interface. Integrated assistance solutions include procedural documentation, video demonstrations, tutorials, and links to resources in the customer community. Developed a knowledge base of best practices and training materials for new and inexperienced database administrators. Successfully refined internal processes that improved the customer experience and reduced product support costs.

Technical Consultant **1997 – 2001**

Systems Analyst - AT&T Digital Broadband, Redmond, Washington

Worked as an analyst on a management consulting team to re-engineer the IT operations at the Pizza Box Project at AT&T Fixed Wireless. Interviewed subject matter experts in order to develop back office documentation for complex, distributed networks and applications. Documentation was developed and presented using Information Mapping. Also contributed to a company knowledge management initiative that harvested intellectual capital, tools, and best practices from Operations Engineering engagements. This job was contracted through Intelliant, Inc.

Process Engineer - The Boeing Company, Seattle, Washington

Designed and implemented a collaborative publishing work flow for Service Engineering within The Boeing Commercial Airplane Group. My customers were 400 engineers who prepare airworthiness directives, service letters, and communiqués to commercial air carriers worldwide. Engineers prepare > 1,500 documents per year across a distributed computing environment. My responsibilities included re-engineering an end-to-end project work flow: Gathering customer requirements and developing project specifications, followed by development, testing, training, status reporting, and customer signoff on final deliverables. Document development processes were re-engineered and quality-controlled, improving initial document acceptance rates by more than 90%. This job was contracted through Consultis, Inc.

Employment History (continued):

Technical Consultant (continued):

Application Systems Analyst - Weyerhaeuser Company, Federal Way, Washington

Worked as a member of an ISO 9001-certified software development team that developed and maintained seven web-enabled Microsoft SQL Server database applications for Weyerhaeuser Company. Through understanding of key end-user scenarios and application design details, delivered tele-conference training to 500 end-users, provided customer support, developed and maintained web-based user documentation, developed project metrics and ad hoc reports for senior management, lead root-cause analysis of application bugs, and drove resolution of defects. Managed special projects including application development, application stress testing, configuration management, business continuity, and knowledge transfer back to the customer. This job was contracted through CIBER, Inc.

Business Writer - Wilmar Corporation, Post Falls, Idaho

Wrote and edited training manuals, manuscripts, and marketing collateral for a health and wellness curriculum. Also prepared financial projections and business models for business plans and marketing presentations.

Professional Educator **1992 – 1997**

Held teaching positions in instructional design environments where I interpreted complex scientific, biological, and mathematical concepts into user-friendly courses for a variety of audiences. Directed university-level field research projects. Developed and presented material for courses in study design, research methods, avian and forest management, endangered species monitoring, landscape ecology, math, general science, statistics, Spanish language, and sustainable development.

Field Biologist **1986 – 1993**

Conducted scientific field trials and experiments that resulted in improved understanding and conservation of marine, tropical, and temperate wildland resources. Designed research projects, conducted field surveys, developed and managed databases, analyzed large, complex datasets, and developed predictive models. Increased world and local knowledge that resulted in improved management and conservation of Nelson's desert mountain sheep, American peregrine falcons, ferruginous hawks, Mexican free-tailed bats, northern goshawks, the Pacific conch, and Rocky Mountain timber wolves.

Education

Master of Science - University of Arizona, Tucson, Arizona **August 1992**
Wildlife and Fisheries Science. GPA – 4.0
College of Agriculture, School of Renewable Natural Resources.

Bachelor of Arts - The Colorado College, Colorado Springs, Colorado **May 1986**
Major: Biology. Minor: Latin American Studies, Spanish. GPA – 3.3
Junior year abroad: University of Costa Rica, San Pedro, Costa Rica.

High school diploma - The Overlake School, Redmond, Washington **June 1982**
Emphasis: College preparation, Life skills, Community service.

Volunteer Experience

Denny Creek Neighborhood Alliance (DCNA) **2001-present**

DCNA is a community-based 501(c)3 environmental advocacy organization. In 2012, DCNA was renamed Finn Hill Neighborhood Alliance (http://fillhillalliance.org). Volunteer activities include advisor to special projects, provide natural resource and landscape ecology perspectives, advocate and teach principles of sustainable development and responsible resource management. Provide environmental education in a variety of settings, guidance for new and ongoing research projects, and write articles for community publications. Help to coordinate all aspects of community service projects and park improvement projects, provide vision and leadership for special events, and contribute to ongoing program development. Also contributed to formation of a community-funded park district in 2004. I have volunteered as a member of the DCNA and FHNA since 2001. Served on the board of directors 2009-2011.

DCNA project list:

2001	J40 habitat analysis for the Juanita Woodlands
2002	Wild Spaces in City Places – King County grant-funded restoration project
2003	Denny Creek watershed vision document
2004	Denny Creek land use study
2005	Watershed study project planning documents
2007	Denny Creek Watershed report
2009	St. Edward State Park resource inventory
2009	Elected to DCNA board of directors
2010	Backyard wildlife habitat certification - Kirkland city-wide certification
2010	O.O. Denny trail mapping project
2011	Big Finn Hill Park bridge trail work and planting
2011	Kirkland Youth Lacrosse – Big Finn Hill Park field turf conversion
2012	Finn Hill Surface Water Management Plan (SWAMP) project
2013	Holmes Point SDO scope, intent, and language review
2013	Presenter at 6th Annual Streamfest on building productive relationships

Publications

Berner, L. 2012. Surface Water Management and Drainage Concerns in the Finn Hill/Holmes Point Neighborhood. Special report. http://finnhillalliance.org/wp-content/uploads/2012/07/2012_15_Jun_FHNA_SWAMP.pdf

Berner, L.R., Krausman, P.R., Wallace, M.C. 1992. Habitat Selection by Mountain Sheep in Mojave Desert Scrub. Desert Bighorn Council Transactions. Vol 36: 13-22.

Krausman, P. R., Wallace, M. C., Zine, M. J., Berner, L. R., Hayes, C. L., and DeYoung, D. W. 1993c. *The effects of low-altitude aircraft on mountain sheep heart rate and behavior* (Technical Report): School of Renewable Natural Resources, College of Medicine/University Animal Care, University of Arizona.

Teaching Experience

City University, Spokane, Washington **1996-1997**
Instructor: College algebra, study skills, time management
Discovery School, Spokane, Washington **1995-1997**
Classroom Teacher: math, science, and Spanish language
Big Sky High School, Missoula, Montana **1994-1995**
Instructor: math, science, study skills, Spanish
The Study Studio Learning Center, Missoula, Montana **1994-1995**
Instructor: math, science, study skills, life skills
It's Spanish Time! Language & Culture Center, Missoula, Montana **1994-1995**
Instructor: Spanish language, Latin American culture
Flathead Valley Community College, Kalispell, Montana **1993-1994**
Instructor: biology, math; Tutor: math, algebra, science
The Center for Sustainable Development Studies, El Rodeo, Costa Rica **1992-1993**
Instructor: Principles of sustainable development, study design, field methods
American Red Cross **1988-1994**
Instructor: Advanced First Aid, Emergency First Responder

Other Professional Experience

Employer: Great Northern Whitewater, West Glacier, Montana April - August 1994
Position: River Guide
Piloted whitewater float trips on the Middle Fork of the Flathead River in all conditions, including Class III and Class IV rapids. Responsibilities: safety and comfort of guests, naturalist interpretation and presentation of natural history information, food preparation and presentation, safety and care of equipment.

Employer: Center for Sustainable Development Studies, Costa Rica September 1992 - May 1993
Position: Associate Faculty
Worked as part of a team of five to develop, coordinate, and present a sustainable development curriculum to North American college students during 2 semesters in Costa Rica. Responsibilities: teaching tropical ecology, research methods, and principles of sustainable development; supervising student research projects, student advising and counseling; writing annual reports; development and writing of risk assessment and management plans, budget preparation; supervision of two resident interns.

Employer: National Park Service May - August 1992
Position: Research Specialist
Developed and conducted a breeding bird survey of sensitive raptor species nesting in the Rincon Mountain Wilderness of Saguaro National Monument, Arizona. Wrote a final report, presented results to agency personnel, and made management recommendations. Supervised 1 field technician.

Other Professional Experience (continued):

Employer: Arizona Game and Fish Department February-August 1989
Position: Wildlife Technician
Conducted peregrine falcon surveys on public land throughout Arizona. Documented new peregrine territories, mapped nest locations, and recorded productivity at active eyries. From July-August, conducted Mexican spotted owl and northern goshawk surveys on the Kaibab Plateau in northern Arizona; climbed goshawk nest trees to collect eggshell fragments and prey remains.

Employer: Colorado Division of Wildlife April - July 1987, 1988
Position: Wildlife Technician
Determined productivity of wild peregrine falcons in Colorado through observation of nesting activities at 35 territories during 2 field seasons. Determined suitability of potential habitat, surveyed suitable areas for undocumented nesting falcons, and rapelled into active eyries to band fledglings and collect eggshell fragments.

Employer: The Peregrine Fund, Inc. 1 August - 15 September 1987
Position: Hack Site Attendant
Cared for 5 fledgling peregrine falcons during their release from a wilderness cliff site near Cripple Creek, Colorado. Responsible for feeding and protecting the young birds, observing fledgling behavior during a 6 week period prior to dispersal, and writing a final report.

Employer: University of Montana Cooperative Wildlife Research Unit October 1986 - March 1987
Position: Wolf Ecology Project Field Technician
Mapped travel routes and monitored activities of "The Magic Pack" in the North Fork of the Flathead River drainage (Glacier National Park), northwestern Montana. Triangulated locations of radio-collared pack members, tracked wolf sign on the ground, and interpreted health and age of wolf kills. Mapped over 500 miles of wolf travels and activities across Rocky Mountain wilderness.

Research Experience

Raptor Ecology and Management, Montana June - August 1993

Affiliation: The School for Field Studies
Topic: Mitigation of Forest Development Activities on Forest Hawks and Owls

Worked with another biologist/educator to develop and present curriculum relevant to principles of ecology, management of forest resources, natural history, and field research methods for two 30-day field courses for college students. Research activities included ground surveys of potential habitat for hawk and owl nest sites, monitoring of active nests, hawk trapping, banding, and telemetering, radio monitoring of bird locations, description of available habitat characteristics, statistical analyses of habitat selection, and recommendations for minimizing forest development impacts on present and potential raptor habitat.

Research Experience (continued):

The Center for Sustainable Development Studies, Costa Rica January-May 1993

Affiliation: The School for Field Studies
Topics: Sustainable Use of Natural Resources; Conservation and Development in Latin America

Worked as part of a team of four to develop, coordinate, and present research methods exercises and directed research projects for 2 semester courses in sustainable development studies. Supervised 6 directed research projects each semester. Research topics included bird, insect, mammal, and herps inventories, edge effect relationships, restoration ecology/wildlife corridor development, land use planning, watershed management, water quality, and environmental education.

Independent Study, Tucson, Arizona October 1991

Affiliation: The University of Arizona
Topic: Human-Bat Interactions and Mexican Free-Tailed Bat Activity Patterns on the University Arizona Campus, Tucson, Arizona

Quantified human activity and environmental parameters affecting bat roosting and feeding behavior on Wildcat Stadium during football game days compared to non-game days. Wrote and presented a final report.

Master's Thesis, southern Nevada May 1990 - May 1992
Affiliation: The University of Arizona
Topic: Mountain Sheep Habitat Selection in Mojave Desert Scrub

Determined habitat selection patterns for 12 mountain sheep in a 310-hectare enclosure in southern Nevada. Quantified vegetation characteristics (e.g., relative density, % composition), digitized habitat use and availability data using Geographic Information System (GIS) technology (ERDAS, IDRISI, ARCINFO) and applied results to an existing habitat evaluation model for mountain sheep. Presented results at professional meetings, submitted 2 papers for publication.

Independent Study, Tipi Rock, Colorado March 1986

Affiliation: The Colorado College
Topic: The Home Range and Prey of Nesting Golden Eagles on the Grassland of El Paso County, Colorado

Monitored activities of two breeding adult and two sub-adult golden eagles with one other student. Conducted prey surveys, collected prey remains, and completed a mathematical comparison of prey availability and prey selection. Wrote and presented a final report.

Research Experience (continued):

Tropical Field Research, Costa Rica January - May 1985

Affiliation: Associated Colleges of the Midwest Exchange Program, San Pedro, Costa Rica
Topic: Comparative Analysis of Feeding Ecology, Spatial Distribution and Territoriality between Pacific and Caribbean Guilds of Damselfishes (Pomacentridae) in Costa Rica

Compared social behavior and feeding ecology of territorial, reef-dwelling Pomacentrids at Caribbean and Pacific sites in Costa Rica. Wrote and presented a final report.

Additional Training

2001-2014 Microsoft Corporation
Cognitive theory, machine learning, instructional design, top task analysis, software development, user research, study design, search engine optimization, customer service, standards of business conduct

2011 Northwest Environmental Business Council
1-day workshop on surface water management best practices and LID

1992 School for Field Studies, Costa Rica
Curriculum development, case study design, team teaching approaches

1986 National Outdoor Leadership School, Sedro Woolley, Washington
28-day Mountaineering Course for Outdoor Educators

1978 The Northwest Outward Bound School, Portland, Oregon
28-day Mountaineering Course

Social Network

- LinkedIn - www.linkedin.com/pub/louis-berner/19/214/829/
- Facebook - https://www.facebook.com/luigi.berner